In the claims:

Please cancel, without prejudice, claims 42-48.

1. **(Currently amended)** A method for promoting one or more of proliferation, ~~growth,~~ differentiation, or survival of a dopaminergic neuronal cell, comprising contacting said cell with an amount of a Sonic hedgehog polypeptide effective to promote one or more of proliferation, ~~growth,~~ differentiation, or survival of said neuronal cell, wherein said Sonic hedgehog polypeptide comprises an amino acid sequence designated in at least one of SEQ ID NO: 8, SEQ ID No:11, SEQ ID No:12, SEQ ID No:13, or an N-terminal fragment thereof having a molecular weight of approximately 19 kDa, and wherein said Sonic hedgehog polypeptide binds a naturally occurring hedgehog ~~patched~~ receptor and promotes hedgehog signaling.

2. **(Currently amended)** A method for promoting one or more of proliferation, ~~growth,~~ differentiation, or survival of a mammalian neuronal cell responsive to hedgehog induction, wherein the mammalian neuronal cell is a dopaminergic neuron or a motor neuron, comprising contacting the cell with an amount of a Sonic hedgehog polypeptide effective to promote, relative to the cell in the absence of hedgehog treatment, at least one of (i) rate of proliferation, ~~growth,~~ (ii) differentiation, or (iii) survival of the cell, wherein said Sonic hedgehog polypeptide comprises an amino acid sequence designated in at least one of SEQ ID NO: 8, SEQ ID No:11, SEQ ID No:12, SEQ ID No:13, or an N-terminal fragment thereof having a molecular weight of approximately 19 kDa, and wherein said Sonic hedgehog polypeptide binds a naturally occurring hedgehog ~~patched~~ receptor and promotes hedgehog signaling.

3. **(Original)** The method of claim 2, which polypeptide mimics the effects of a naturally-occurring hedgehog protein on said cell.

4. **(Cancelled)**

5. **(Currently amended)** The method of claim 2, wherein the neuronal cell is a dopaminergic neuron ~~polypeptide comprises an amino acid sequence at least 90% identical to an amino acid sequence designated in at least one of SEQ ID No:8, SEQ ID No:11, SEQ ID No:12,~~

~~SEQ ID No:13, or an N-terminal fragment thereof of at least 100 contiguous amino acids that binds a naturally occurring patched receptor~~.

6. (**Currently amended**) The method of claim 5, wherein the N-terminal fragment is ~~which polypeptide is~~ an N-terminal auto-proteolytic fragment of SEQ ID NO: 8, SEQ ID NO: 11, SEQ ID NO: 12, or SEQ ID NO: 13 ~~a hedgehog polypeptide~~.

7-10. (**Cancelled**)

11. (**Previously presented**) The method of claim 2, wherein the polypeptide promotes the differentiation of said neuronal cell.

12. (**Currently amended**) The method of claim 11, wherein said neuronal cell is ~~selected from any of a motor neuron, a cholinergic neuron,~~ a dopaminergic neuron~~, a serotenergic neuron, or a peptidergic neuron~~.

13. (**Currently amended**) The method of claim 1 ~~11~~, wherein the polypeptide promotes survival of said neuronal cell.

14-22. (**Cancelled**)

23. (**Currently amended**) A method for inducing a cell to differentiate to a dopaminergic neuron or a motor neuron ~~neuronal cell type~~, comprising contacting said cell with an amount of a Sonic hedgehog polypeptide effective to induce said cell to differentiate to a dopaminergic neuron or a motor neuron, ~~a neuronal cell type,~~ wherein said Sonic hedgehog polypeptide comprises an amino acid sequence designated in at least one of SEQ ID NO: 8, SEQ ID No:11, SEQ ID No:12, SEQ ID No:13, or an N-terminal fragment thereof having a molecular weight of approximately 19 kDa, and wherein said Sonic hedgehog polypeptide binds a naturally occurring ~~patched~~ hedgehog receptor and promotes hedgehog signaling.

24. (**Currently amended**) The method of claim 23, comprising contacting said cell with an

amount of a Sonic hedgehog polypeptide effective to induce said cell to differentiate to a dopaminergic neuron ~~wherein said polypeptide comprises an amino acid sequence encoded by a nucleic acid that hybridizes under stringent conditions, including a wash step of 0.2X SSC at 65 °C, to a nucleic acid sequence selected from any of SEQ ID NO: 1, SEQ ID NO: 4, SEQ ID NO: 5, or SEQ ID NO: 6, and wherein said polypeptide binds a naturally occurring patched receptor~~.

25. (**Currently amended**) The method of claim 24, wherein the N-terminal fragment is an N-terminal auto-proteolytic fragment of SEQ ID NO: 8, SEQ ID NO: 11, SEQ ID NO: 12, or SEQ ID NO: 13 ~~which polypeptide is a bioactive fragment of a Sonic hedgehog polypeptide, and wherein said bioactive fragment binds a naturally occurring patched receptor~~.

26. (**Currently amended**) The method of claim 23, wherein the N-terminal fragment is an N-terminal auto-proteolytic fragment of SEQ ID NO: 8, SEQ ID NO: 11, SEQ ID NO: 12, or SEQ ID NO: 13 ~~said neuronal cell type is selected from any of motor neurons, cholinergic neurons, dopaminergic neurons, serotenergic neurons, and peptidergic neurons~~.

27-48. (**Cancelled**)

49. (**Currently amended**) A method for inducing a cell to differentiate to a dopaminergic neuron or a motor neuron ~~neuronal cell phenotype~~, comprising contacting said cell with an amount of a Sonic hedgehog polypeptide comprising an amino acid sequence encoded by a nucleic acid that hybridizes under stringent conditions, including a wash step of 0.2X SSC at 65 °C, to a nucleic acid sequence selected from SEQ ID No: 1, SEQ ID No: 4, SEQ ID No: 5, and SEQ ID No: 6, wherein said hedgehog polypeptide has a molecular weight of approximately 19 kDa and binds to a naturally occurring ~~patched~~ hedgehog receptor, and wherein said amount is effective to induce a cell to differentiate to a dopaminergic neuron or a motor neuron ~~neuronal cell phenotype~~.

50. (**Currently amended**) The method of claim 49, wherein said hedgehog polypeptide comprises an N-terminal auto-proteolytic fragment of SEQ ID NO: 8, SEQ ID NO: 11, SEQ ID

NO: 12, or SEQ ID NO: 13 ~~a hedgehog polypeptide, and wherein said hedgehog polypeptide binds a naturally occurring patched receptor~~.

51. **(Currently amended)** The method of claim 49, wherein said cell is induced to differentiate to a ~~neuronal cell phenotype is selected from motor neurons, cholinergic neurons,~~ dopaminergic neurons~~, serotonergic neurons, and peptidergic neurons~~.

52. **(Currently amended)** A method for promoting one or more of proliferation, ~~growth,~~ differentiation, or survival of a neural stem cell, comprising contacting the cell with an amount of a Sonic hedgehog polypeptide comprising an amino acid sequence encoded by a nucleic acid that hybridizes under stringent conditions, including a wash step of 0.2X SSC at 65 °C or higher stringency, to a nucleic acid sequence selected from SEQ ID NO: 1, SEQ ID NO: 4, SEQ ID NO: 5, and SEQ ID NO: 6, wherein said hedgehog polypeptide has a molecular weight of approximately 19 kDa and binds to a naturally occurring ~~patched~~ hedgehog receptor, and wherein said amount is effective to promote proliferation, ~~growth,~~ differentiation, or survival of the neural stem cell.

53. **(Currently amended)** The method of claim 52, wherein said polypeptide comprises an N-terminal auto-proteolytic fragment of SEQ ID NO: 8, SEQ ID No:11, SEQ ID No:12, or SEQ ID No:13 ~~N-terminal auto-proteolytic fragment of a hedgehog polypeptide, and polypeptide binds a naturally occurring patched receptor~~.

54. **(Currently amended)** The method of claim 52, wherein said hedgehog polypeptide promotes proliferation ~~differentiation~~ of said neural stem cell.

55. **(Currently amended)** The method of claim 52 ~~54~~, wherein said hedgehog polypeptide promotes differentiation of said neural stem cell to a dopaminergic neuron ~~glial cell~~.

56. **(Currently amended)** The method of claim 52 ~~54~~, wherein said hedgehog polypeptide promotes survival ~~differentiation~~ of said neural stem cell ~~to a neuron~~.

57. (**New**) The method of claim 53, comprising contacting said cell with an amount of said hedgehog polypeptide effective to promote proliferation of said neural stem cell.

58. (**New**) The method of claim 53, comprising contacting said cell with an amount of said hedgehog polypeptide effective to promote differentiation of said neural stem cell to a dopaminergic neuron.

59. (**New**) The method of claim 53, comprising contacting said cell with an amount of said hedgehog polypeptide effective to promote survival of said neural stem cell.

60. (**New**) The method of claim 2, comprising contacting said cell with an amount of said hedgehog polypeptide effective to promote proliferation of said neuronal cell.

61. (**New**) The method of claim 1, comprising contacting said cell with an amount of said hedgehog polypeptide effective to promote proliferation of said neuronal cell.

62. (**New**) The method of claim 2, comprising contacting said cell with an amount of said hedgehog polypeptide effective to promote survival of said neuronal cell.

63. (**New**) The method of claim 61, wherein the N-terminal fragment is an N-terminal auto-proteolytic fragment of SEQ ID NO: 8, SEQ ID NO: 11, SEQ ID NO: 12, or SEQ ID NO: 13.

64. (**New**) The method of claim 62, wherein the N-terminal fragment is an N-terminal auto-proteolytic fragment of SEQ ID NO: 8, SEQ ID NO: 11, SEQ ID NO: 12, or SEQ ID NO: 13.

65. (**New**) The method of claim 6, comprising contacting said cell with an amount of said hedgehog polypeptide effective to promote survival of said neuronal cell.

66. (**New**) A method for promoting one or more of proliferation, differentiation, or survival of a dopaminergic neuronal cell, comprising contacting said cell with means for promoting

hedgehog signaling in an amount effective to promote one or more of proliferation, differentiation, or survival of said neuronal cell.

67. **(New)** A method for promoting one or more of proliferation, differentiation, or survival of a mammalian neuronal cell responsive to hedgehog induction, wherein the mammalian neuronal cell is a dopaminergic neuron or a motor neuron, comprising contacting said cell with means for promoting hedgehog signaling in an amount effective to promote one or more of proliferation, differentiation, or survival of said neuronal cell.

68. **(New)** A method for promoting one or more of proliferation, differentiation, or survival of a neural stem cell, comprising contacting said cell with means for promoting hedgehog signaling in an amount effective to promote one or more of proliferation, differentiation, or survival of said neural stem cell.

69. **(New)** A method for inducing a cell to differentiate to a dopaminergic neuron or a motor neuron, comprising contacting said cell with means for promoting hedgehog signaling in an amount effective to promote differentiation of said cell to a dopaminergic neuron or a motor neuron.

70. **(New)** The method of claim 69, comprising contacting said cell with means for promoting hedgehog signaling in an amount effective to promote differentiation of said cell to a dopaminergic neuron.

71. **(New)** The method of claim 68, comprising contacting said cell with means for promoting hedgehog signaling in an amount effective to promote proliferation of said neural stem cell.

72. **(New)** The method of claim 68, comprising contacting said cell with means for promoting hedgehog signaling in an amount effective to promote differentiation of said neural stem cell.

73. (**New**) The method of claim 68, comprising contacting said cell with means for promoting hedgehog signaling in an amount effective to promote survival of said neural stem cell.

74. (**New**) The method of claim 66, comprising contacting said cell with means for promoting hedgehog signaling in an amount effective to promote survival of said neuronal cell.

75. (**New**) The method of claim 67, comprising contacting said cell with means for promoting hedgehog signaling in an amount effective to promote survival of said neuronal cell.

76. (**New**) The method of claim 75, wherein said neuronal cell is a dopaminergic neuron.

77. (**New**) The method of claim 66, comprising contacting said cell with means for promoting hedgehog signaling in an amount effective to promote proliferation of said neuronal cell.

78. (**New**) The method of claim 67, comprising contacting said cell with means for promoting hedgehog signaling in an amount effective to promote proliferation of said neuronal cell.

79. (**New**) A method for promoting one or more of proliferation or survival of an adult mammalian neuronal cell responsive to hedgehog induction, comprising contacting said cell with means for promoting hedgehog signaling in an amount effective to promote one or more of proliferation or survival of said neuronal cell.

80. (**New**) The method of claim 79, comprising contacting said cell with means for promoting hedgehog signaling in an amount effective to promote proliferation of said neuronal cell.

81. (**New**) The method of claim 79, comprising contacting said cell with means for promoting hedgehog signaling in an amount effective to promote survival of said neuronal cell.